

A NEW GENUS OF THE BRYOZOAN SUPERFAMILY SCHIZOPORELLOIDEA, WITH REMARKS ON THE VALIDITY OF THE FAMILY LACERNIDAE JULLIEN, 1888

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Vitrius gen. nov. is proposed for the cheilostome bryozoan *Schizoporella insignis* Hincks (Recent, Africa, Australia and New Zealand). It appears to be related to *Lacerna* Jullien, *Phonicosia* Jullien, and *Cribellopora* Gautier, sharing with them a calcareous cryptocystidean shield with conspicuous areolae, bordered by a narrow gymnocyst, and a membranous ovicellular ectooecium (*i.e.*, the endooecium being the exposed skeletal surface). The little-known family Lacernidae Jullien, essentially unused for more than a century, is here considered available for genera with the above suite of characters as well as the presence of complex pore-occlusions in some of the genera.

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In the course of routine examination of the bryozoan collections in the South Australian Museum (SAM), the Western Australian Museum (WAM) and the New Zealand Oceanographic Institute (NZOI), three Recent samples from South Australia, Western Australia and Stewart Island, New Zealand were identified as *Schizoporella insignis* Hincks, 1881. Previously known from Africa (Hincks 1881) and South Australia (MacGillivray 1891), the species differs markedly from *Schizoporella* Hincks, 1877 *sensu stricto*, and a new genus is here proposed for it. The new genus shares some important features with *Lacerna* Jullien, 1888 and related genera. The group appears to merit recognition as a discrete family within the Schizoporelloidea for which the little-used name Lacernidae Jullien, 1888 is available.

SYSTEMATICS

Order Cheilostomida Busk, 1852
Suborder Ascophorina Levinsen, 1909
Infraorder Lepraliomorpha Gordon, 1989
Superfamily Schizoporelloidea Jullien, 1883
Family Lacernidae Jullien, 1888

Vitrius Parker & Gordon, gen. nov.

Generic diagnosis

Colony encrusting. Zooids glassy, the frontal shield cryptocystidean, with a ring of lateral pores that also encircles the orifice, the porous margin rimmed by gymnocrystal calcification. Proximal rim of orifice more or less straight with a distinct sinus. Oral spines and avicularia absent. Ovicell prominent, the endooecium smooth, minutely pitted, the ectooecium entirely membranous; closed by the zooidal operculum. Basal pore-chambers present.

Type species

Schizoporella insignis Hincks, 1881.

Etymology

The generic name *Vitrius* is derived from the Latin adjective *vitreus*, meaning glassy or transparent.

Remarks

Vitrius differs from *Schizoporella* Hincks, 1877 in having glassy zooids, a centrally imperforate frontal shield with conspicuous marginal pores only, a well-developed gymnocrystal rim, uncalcified ectooecium, and closure of the ovicell by the zooidal operculum. It is similar to three other schizoporelloidean genera, *Lacerna* Jullien, 1888, *Phonicosia* Jullien, 1888, and *Cribellopora* Gautier, 1957, in important features of the frontal shield and ovicell, though differing in details – *Lacerna* has oral spines, short radii in the frontal-shield pores, scarcely any gymnocrystal, and a low rim of ectooecial calcification bordering the ovicell; *Phonicosia* has oral spines, avicularia, reduced gymnocrystal, minutely pitted complex pore-closures, and an ovicell not closed by the zooidal operculum; *Cribellopora*, which has one or no oral spines, is characterized by complex pores with complete radii. *Vitrius* is at present monotypic.

Vitrius insignis (Hincks, 1881)
(Figs 1, A–D)

Schizoporella insignis Hincks, 1881: 134, pl. 5, fig. 10; MacGillivray 1891: 82, pl. 9, fig. 8.

Type locality

Africa – no further details given by Hincks.

Material examined

New Zealand: off South Cape, Stewart Island, 55 m, no other data NZOI Z6892; *South Australia*: Boston Bay, southern Eyre Peninsula, no other data (probably collected by O'Halloran *ca* 1890), small ancestrulate colony on seagrass, *Posidonia* sp., SAM L667; *Western Australia*: north side of Beacon Island, Houtman Abrolhos, 25.vi.1985, coll. S. M. Slack-Smith, three small ancestrulate colonies on seaweed, *Sargassum* sp., WAM 632-91.

The sample from Port Wakefield, South Australia listed and figured as *Schizoporella insignis* by MacGillivray (1891) cannot be found in the Museum of Victoria (T. Stranks *in litt.* 12.ix.1991).

Distribution

Stewart Island, New Zealand; South Australia; Houtman Abrolhos, Western Australia; (?southern) Africa.

Description

Colony encrusting, small. Zooids hyaline, 0.38-0.51 × 0.23-0.38 mm the frontal shield with a ring of relatively large simple pores that also encircles the orifice, the porous area bounded by, and set within, a rim marking the edge of the surrounding gymnocyst, with many of the pores occurring partly under the rim; the central area of shield smooth, with a short umbo. Orifice proportionately large in relation to the zooid transversely D-shaped, with a straight proximal rim, and a subcircular sinus that is constricted distally. Opercular tab articulated, and set off from the rest of the operculum by a sclerite. No oral spines or avicularia. Ovicell prominent, closed by the zooidal operculum, the endooecium wholly exposed, more or less smooth, with a minutely pitted area, the ectooecium membranous. Interzooidal communications comprising widely open basal pore-chambers, sealed externally by a membrane, with string of simple pores along each septulum. Ancestrula with a membranous frontal wall, no spines.

Remarks

Thanks to the courtesy of Mr P. J. Chimonides of the Natural History Museum, London, we have been able to examine scanning electron micrographs of the holotype of *Schizoporella insignis*. It is in extremely poor condition, being scarcely recognizable as bryozoan, comprising three separated zooids, one of which is broken and all three covered with debris. Only part of the proximolateral gymnocyst and a lateral septulum of one zooid give a clue as to identity, and these features accord with what we have seen in the Australasian specimens.

The illustrations of Hincks (1881) and MacGillivray (1891) both show a feature of the frontal shield not appreciated by SEM but rather seen in transparency, *i.e.*, a line bisecting the marginal pores. This line is

the inner edge of the narrow gymnocyst, which may cover half the area of many or most of the pores. These pores are the simplest among the genera here recognized as lacernid, lacking calcareous radii or other occlusions though a narrow flange-like rim may occur within the pore.

The articulation of the operculum is not uncommon among schizoporelloideans. One genus, *Arthropoina* Levinsen, 1909, is named after this feature, but it is possibly to be expected wherever the zooidal operculum is used also to seal the ovicellular orifice and the broad anterior flap (porta) moves through an arc of some 30°-40° relative to the plane of the tab (vanna) sealing the orificial sinus. The articular sclerite in *Vitrius* can easily be seen in the intact operculum even by reflected light.

As Hincks (1884) pointed out, *Schizoporella insignis* MacGillivray 1883 is a junior primary homonym of *S. insignis* Hincks, 1881 and cannot be retained. It is superseded by its later name *Schizoporella daedala* MacGillivray, 1887 (= *Chiastosella daedala*: Stach 1937).

DISCUSSION

The characters of *Vitrius* appear to ally the genus (at present monospecific) with *Lacerna* Jullien, 1888, *Phonicosia* Jullien, 1888, and *Cribellopora* Gautier, 1957, traditionally included in the family Schizoporellidae Jullien, 1883. *Lacerna* is the type genus of the family Lacernidae Jullien, 1888, which was introduced for it and *Phonicosia*. Jullien's familial diagnosis is brief and rather general — our paraphrase of his French is 'Orifice with the distal rim arched; the posterior rim straight, with a median sinus; the lateral row of pores can occur in two series distally'. With only one hesitant exception, the family name Lacernidae has not, to our knowledge, been used since. Even Calvet (1904), who worked with Jullien (*e.g.*, Jullien & Calvet 1903), included the type species of *Lacerna* in *Schizoporella*. The one exception is Harmer (1957), who posthumously cited the family as comprising only *Lacerna* (which he wrongly considered to include *Buffonellodes*) and possibly *Aimulosia*, but a footnote by A. B. Hastings states that, in unpublished notes, Harmer indicated that he considered merging the Lacernidae in the Schizoporellidae.

Jullien's (1888) diagnosis of the family was trivial, noting features sometimes scarcely useful at the species-level. Furthermore, the type genus and species (*Lacerna hosteensis*) were incompletely described and illustrated, remaining so until very recently. Waters's (1904) apparent redescription was of another species, recently named as *Lacerna watersi* (Hayward & Thorpe 1989). López Gappa (1977) gave a good illustration of fertile *L. hosteensis* and Hayward (1991)

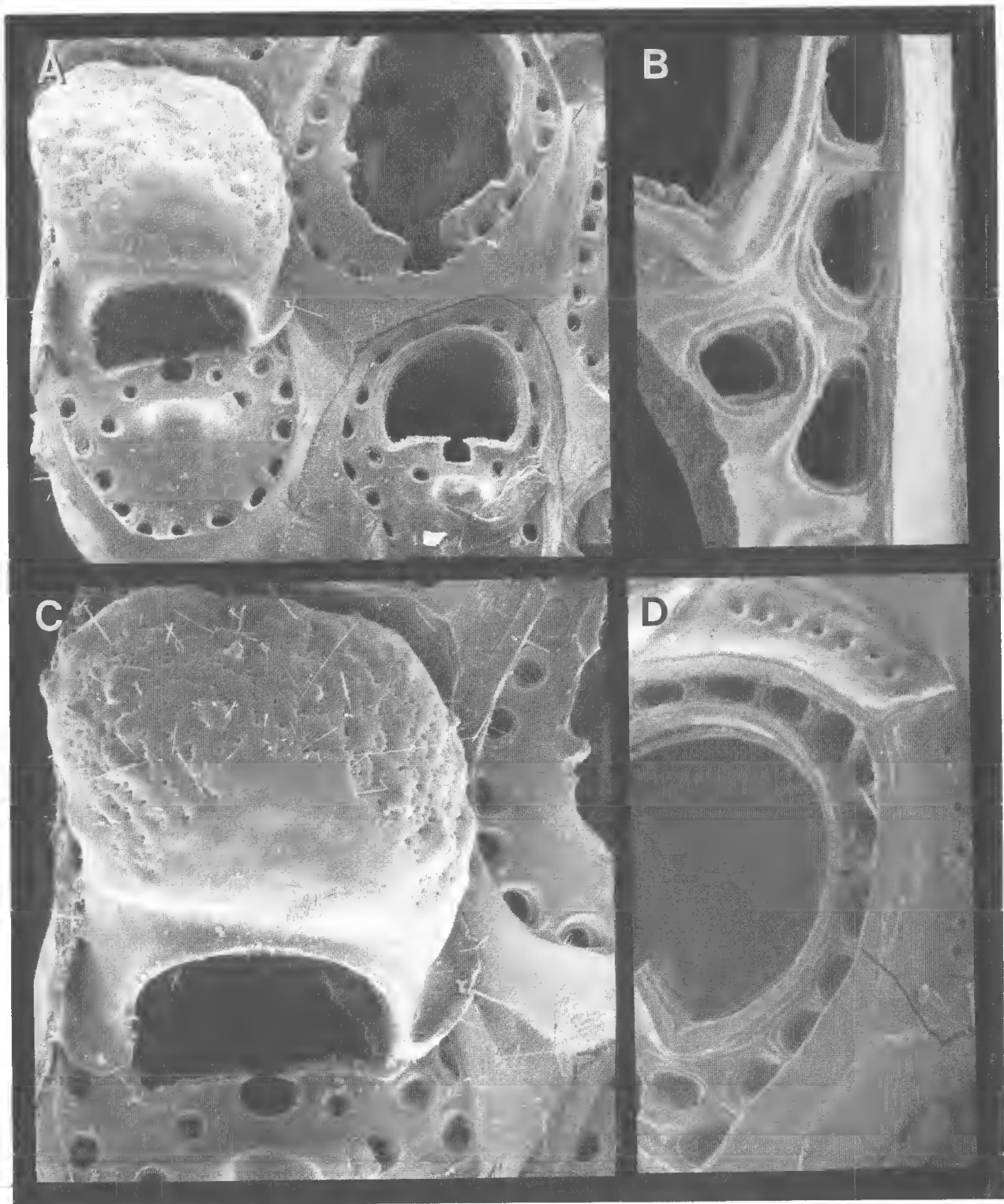


FIGURE 1. *Vitrius insignis* (Hincks), from off South Cape, Stewart Island, New Zealand. A, Group of zooids. B, Close-up of lateral pores at the edge of the gymnocyst adjacent to the orifice. C, Ovicell. D, Widely open pore-chambers distal to the orifice.

examined the type specimen and illustrated the species by SEM. Thus it is now possible to evaluate the distinctiveness of the Lacernidae for the first time. Hayward (1991) did not assign *Lacerna* to a family but, *inter res*, discussed the status of *L. eatoni* (Busk, 1876), noting its general appearance to *Phonicosia* and pointing out that López Gappa (1978) had assigned it to *Cribellopora*. These associations accord with our conclusion that these three genera, with *Vitrius*, are closely related and may be grouped together.

Whatever the eventual constitution or reconstitution of the Schizoporellidae, the lacernid genera *Lacerna*, *Vitrius*, *Phonicosia* and *Cribellopora* cannot be regarded as confamilial with *Schizoporella sensu stricto*, and the family Lacernidae Jullien, 1888 is here used to accommodate them. The Lacernidae may be distinguished from the Schizoporellidae *sensu stricto* primarily on the basis of the ovicell, which in the former has only a single calcified layer, the endooecium (the ectooecium being entirely membranous), and which develops in the manner described by Nielsen (1981) for *Fenestulina* Jullien, 1888. For the Schizoporellidae *s. s.*, the development of the ovicell has, remarkably, not yet been described, but from our preliminary SEM examination of *Schizoporella errata* (Waters, 1878) we conclude that in this family both ovicellular layers are calcified and fused, with the intervening space obliterated. Even if it should be shown that the ectooecium of *Schizoporella s. s.* is membranous, however, significant differences between the Schizoporellidae and the Lacernidae remain, *e.g.* the lacernid ovicell is not overlaid by thick secondary calcification and the hypostegal coelom of the distal zooid. Additional features of the Lacernidae include a mostly centrally imperforate frontal shield that tends not to become thickly calcified but often remains hyaline, a vestigial to proximolaterally well-developed gymnocyst, and marginal pores that can have quite complex occlusions. In *Lacerna* the pores are simple openings early in zooidal ontogeny, but soon develop short simple radii that do not meet in the centre of the pore. In *Cribellopora* the pores develop as in *Lacerna*, but the radii meet and fuse in the centre of each pore, and in some species a fine calcareous mesh may further develop between the radii. In *Phonicosia* a fine mesh without distinct radii occurs, partly or totally occluding the pore-opening when fully developed. *Vitrius* lacks radii or a mesh, having only a narrow circular flange within each pore. Some or all of these pores in these genera are areolar, containing a rosette of transporting cells by which the main body cavity of the zooid (perigastric coelom) communicates with the thin cavity above the cryptocystidean shield (hypostegal coelom) (see Banta 1970, 1971, 1973). The presence of significant pore-occlusions, especially in *Phonicosia*, would seem to prevent or severely restrict effective nutrient transport to the hypostegal coelom and perhaps it is significant that frontal budding (which requires such

transport) has not been reported in these genera. The apparent lack of secondary calcification may be another possible sign of restricted nutrient transfer.

Insofar as they have basal pore-chambers, *Lacerna*, *Phonicosia* and *Vitrius* share the same method of budding new zooids – intrazoooidal in the terminology of Lidgard (1985). *Cribellopora* lacks basal pore-chambers and budding is zooidal (Lidgard 1985).

Diagnosis of Lacernidae Jullien, 1888

Colony encrusting. Zooids with a relatively thin cryptocystidean shield, partly or mostly imperforate centrally, the lateral pores often with complex closures, the frontal area bordered by a vestigial to well-developed proximolateral gymnocyst. Orifice with a distinct sinus, the operculum sometimes articulated. Oral spines and avicularia present or absent. Ovicell with frontally imperforate calcified endooecium and entirely membranous ectooecium. Basal pore-chambers or mural septula present; budding thus intrazoooidal or zooidal. Constituent genera: *Lacerna*, *Phonicosia*, *Vitrius*, *Cribellopora*.

Stratigraphic range of Lacernidae

Eocene to Recent. An undescribed species of *Cribellopora* occurs in an Eocene outcrop at Alma, near Oamaru, South Island, New Zealand (DPG, pers. obs.). The earliest records from the published literature are of *Cribellopora latigastrea* (David, 1949) from the Miocene of Austria and the Rhône Valley (David & Pouyet 1974; Cook 1985) and *Phonicosia circinata* (MacGillivray 1869) from the Pliocene near Waipukurau, North Island, New Zealand (Brown 1952, as *Arthropoma circinatum*).

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